Related Topics

Programs and Projects
Subjects of Investigation
ARS National Programs
Search for a research project
Larkspur Published Research
Locoweed Published Research
Lupine Published Research
Other Plants Published Research
Pine Needles Published Research

Poisonous Plants

Arrowgrass
Bracken Fern (Western Bracken)
Bitter Rubberweed
Broom and Threadleaf Snakeweed
Chokecherry
Copperweed
Deathcamas
False Hellebore
Greasewood
Halogeton
Hemp Dogbane
Horsebrush
Larkspur
Locoweed
Lupine
Milkvetch
Milkweed
Nitrate-accumulating plants
Oak
Other toxic plants
Colorado Rubberweed or Pingue
Poison Hemlock
Ponderosa Pine
Rayless Goldenrod
Selenium-Accumulating Plants
Sneezeweed
Spring Parsley
St. Johnswort
Tansy Ragwort
Threadleaf and Riddell's

Selenium-Accumulating Plants

Selenium is accumulated by a number of plants in sufficient amounts to be toxic if consumed by livestock. Plants that accumulate high amounts of selenium and may require selenium for growth are often found in selenium rich areas. Historically these plants have been called indicator plants. The indicator plants include certain species of Astragalus, prince's plume, and some woody asters. The indicator plants may accumulate up to 3000 parts per million (ppm) selenium.

Plants that will accumulate selenium but do not have a requirement for it are called facultative or secondary selenium absorbers. These plants can accumulate up to 50 ppm. The secondary selenium accumulators include some native range plants, and crop plants such as western wheatgrass, barley, wheat, and alfalfa. Plants containing more than 5 ppm selenium are potentially toxic in cattle.

Where Selenium-Accumulating Plants Grow

The major seleniferous areas of the West can be found in North and South Dakota, Montana, Wyoming, Colorado, and Utah. Selenium poisoning occurs in the areas that have soils high in selenium. Both indicator and secondary selenium-accumulating plants grow in these areas.

Astragalus bisulcatus, two-grooved milkvetch, is a selenium-accumulating plant. Though it is not palatable to most livestock, it has been implicated in some cases of selenium toxicosis. It has been suggested that even though selenium accumulating plants are not readily eaten, they contribute to selenium toxicosis by making selenium in the soil available to neighboring, palatable, secondary selenium-accumulating plants.

How It Affects Livestock

Selenium is required in the diet of most animals. Concentrations of 0.3 ppm are recommended for most food producing livestock. Acute selenosis has been associated with ingesting large amounts of selenium such as would happen if animals eat indicator plants (>400 ppm). Oral selenium doses of between 1 and 5 mg/kg body weight are considered toxic. Lower doses of between 5 and 40 ppm in the diet for several weeks or months result in chronic poisoning, oftentimes called alkali disease. The mechanism of toxicity is not completely understood, but the clinical and morphologic lesions suggest glutathione depletion and secondary lipid peroxidation are important in pathogenesis.

Signs and Lesions of Poisoning

Acute Poisoning:

- Lethargy, nonresponsiveness
- Dyspnea with abnormal posture
- Unsteady gait
- Diarrhea
- Abdominal pain (teeth grinding)
- Increased pulse, respiration rate and body temperature.
- Prostration
- Death (Sheep may not show signs and are found dead)
- Necropsy and histologic lesions include pulmonary edema, hydrothorax, and pale myocardium. Additionally there may be mild enteritis and passive congestion of the liver

Chronic Poisoning:

- Dullness
- Rough hair coat
- Emaciation
- Lack of vitality, anemia
- Lameness, joint stiffness
- Hooves may become overgrown or deformed (circular bumps or breaks below coronary band)
- Loss of long hair (horses commonly lose their mane and tail)
- Histologic lesions variable but often include cardiomyopathy and liver cirrhosis
- Reproductive losses in cattle

How to Reduce Losses

The only practical method of reducing losses in livestock due to selenium poisoning is to prevent animals from eating excessive amounts of selenium-containing plants. Affected animals that are removed from seleniferous forages may recover without apparent permanent effects. The rate of recovery is dependent upon the severity

Groundsels

Water hemlock

Yew

of intoxication.

Last Modified: 2/7/2006